CLAIMS

1. An ultrasonographic method, comprising:

a first encoding transmission/reception step for sequentially modulating, with an encoding set including a plurality of modulation codes in which at least two are in complementary relationship, and outputting a basic wave to a probe as an encoding drive signal and transmitting an ultrasonic beam and demodulating each reception signal output from the probe with demodulation codes corresponding to the modulation codes in the encoding set;

a step for obtaining a first synthesis signal by synthesizing demodulation signals resulting from the demodulation in the first encoding transmission/reception step;

a second encoding transmission/reception step for sequentially modulating, with a reverse encoding set including a plurality of modulation codes in reverse order of the modulation codes in the encoding set, and outputting a basic wave to the probe as an encoding drive signal and transmitting an ultrasonic beam and demodulating each reception signal output from the probe with demodulation codes corresponding to the modulation codes in the reverse encoding set;

a step for obtaining a second synthesis signal by

synthesizing demodulation signals resulting from the demodulation in the second encoding transmission/reception step;

a step for obtaining a third synthesis signal by synthesizing the first synthesis signal and the second synthesis signal; and

a step for reconstructing an ultrasonograph based on the third synthesis signal.

2. The ultrasonographic method according to Claim 1, wherein the plurality of modulation codes in the reverse encoding set have phases resulting from a rotation of the phases of the modulation codes in the encoding set.

3. The ultrasonographic method according to Claim 2, wherein the step for obtaining the first synthesis signal and the step for obtaining the second synthesis signal are performed after the first encoding transmission/reception step and the second encoding transmission/reception step.

4. The ultrasonographic method according to Claim 2, wherein the first encoding transmission/reception step and the second encoding transmission/reception step are performed on different scan lines.

5. The ultrasonographic method according to Claim 2, wherein an ultrasonograph is reconstructed by obtaining the third synthesis signal for each scan line of two different scan lines in the reverse order of performing the first

encoding transmission/reception step and the second encoding transmission/reception step and synthesizing the two third synthesis signals.

6. The ultrasonographic method according to Claim 2, wherein the first encoding transmission/reception step includes dividing and transmitting ultrasonic beams corresponding to the modulation codes in the encoding set to a plurality of first scan lines, and the second encoding transmission/reception step includes dividing and transmitting ultrasonic beams corresponding to the modulation codes in the reverse encoding set to a plurality of second scan lines, which are at least partially different from the plurality of first scan lines.

7. The ultrasonographic method according to Claim 2, wherein, when the encoding set includes a first modulation code and a second modulation code, the reverse encoding set includes a third modulation code having the inverted polarity of that of the second modulation code and a fourth modulation code having the inverted polarity of that of the first modulation code in order.

8. The ultrasonographic method according to Claim 2, wherein, when the encoding set includes first to third modulation codes, the reverse encoding set includes a fourth modulation code having the inverted polarity of that of the third modulation code, a fifth modulation code having the

inverted polarity of that of the second modulation code and a sixth modulation code having the inverted polarity of that of the first modulation code in order.

9. The ultrasonographic method according to Claim 2, wherein, when the encoding set includes first to fourth modulation codes, the reverse encoding set includes a fifth modulation code having the inverted polarity of that of the fourth modulation code, a sixth modulation code having the inverted polarity of that of the third modulation code, a seventh modulation code having the inverted polarity of that of the second modulation code and an eighth modulation code having the inverted polarity of that of the first modulation code in order.

10. The ultrasonographic method according to Claim 2, wherein, when each of the encoding set and reverse encoding set includes N modulation codes, the Mth modulation code in the reverse encoding set has the inverted polarity of that of the (N-M+1)th modulation code in the encoding set where N is a natural number equal to or higher than 5 and M is a natural number equal to or lower than N.

11. The ultrasonographic method according to Claim 2, wherein the encoding set includes a pair of Golay codes.

12. An ultrasonographic device, comprising a probe for transmitting/receiving an ultrasonic wave; transmitting means that outputs a drive signal for the probe; receiving

means that processes a reception signal output from the probe; image processing means that reconstructs an ultrasonograph based on a synthesis signal output from the receiving means; display mean that displays the reconstructed ultrasonograph; and control means that controls the transmitting means, the receiving means, the image processing means and the display means,

wherein the transmitting means includes means that creates an encoding set consisting of a plurality of modulation codes in which at least two are in complementary relationship and a reverse encoding set consisting of a plurality of modulation codes in which the arrangement order of modulation codes of the encoding set is reversed and means that modulates a basic wave with information on the encoding set and the reverse encoding set and generates an encoding drive signal; and

the receiving means includes means that demodulates each reception signal corresponding to the encoding drive signal modulated with the encoding set with each demodulation code corresponding to each modulation code in the encoding set, means that synthesizes demodulated signals and generates a first synthesis signal, means that demodulates each reception signal corresponding to the encoding drive signal modulated with the reverse encoding set with each demodulation code corresponding to each

modulation code in the reverse encoding set, means that synthesizes the demodulated signals and generates a second synthesis signal, and means that generates a third synthesis signal from the first synthesis signal and the second synthesis signal.

13. The ultrasonographic image according to Claim 12, wherein the plurality of modulation codes in the reverse encoding set have phases resulting from rotation of the phases of the modulation codes in the encoding set.

14. The ultrasonographic image according to Claim 12, wherein the transmitting means transmits a plurality of first ultrasonic transmission beams from the probe to a first scan line by encoding drive signals corresponding to the encoding set and the reverse encoding set and transmits a plurality of second ultrasonic transmission beams from the probe to a second scan line, which is different from the first scan line, by encoding drive signals sequentially modulated in interchanged set order of the encoding set and the reverse encoding set; and

the receiving means demodulates and then synthesizes reception signals corresponding to the first ultrasonic transmission beams and reception signals corresponding to the second ultrasonic transmission beams.

15. The ultrasonographic device according to Claim 12, wherein the transmitting means transmits a plurality of

first ultrasonic transmission beams from the probe to a first scan line by an encoding drive signal corresponding to the encoding set and transmits a plurality of second ultrasonic transmission beams from the probe to a second scan line, which is different from the first scan line, by an encoding drive signal corresponding to the reverse encoding set; and

the receiving means demodulates and then synthesizes reception signals corresponding to the first ultrasonic transmission beams and reception signals corresponding to the second ultrasonic transmission beams.

16. The ultrasonographic device according to Claim 12, wherein the transmitting means divides and transmits a plurality of ultrasonic transmission beams to be transmitted from the probe by encoding drive signals corresponding to the encoding set and the reverse encoding set to a plurality of scan lines; and

the receiving means demodulates and then synthesizes reception signals corresponding to the ultrasonic transmission beams.

17. The ultrasonographic device according to Claim 12, wherein, when a plurality of ultrasonic transmission beams to be transmitted from the probe by encoding drive signals corresponding to the encoding set and the reverse encoding set are divided and transmitted to a plurality of scan lines,

the transmitting means divides and transmits scan ultrasonic beams to the plurality of scan lines; and

the receiving means includes correlation determining means that analyzes a correlation between reception signals corresponding to the scan ultrasonic beams and obtains a spatial correlation of the subject and determines the number of scan lines for dividing the plurality of ultrasonic transmission beams based on the spatial correlation.

18. The ultrasonographic device according to Claim 12, wherein, when a plurality of ultrasonic transmission beams to be transmitted from the probe by encoding drive signals corresponding to the encoding set and the reverse encoding set are repeatedly transmitted to scan lines, the transmitting means repeatedly transmits scan ultrasonic beams to the scan lines; and

the receiving means includes correlation determining means that analyzes a correlation between reception signals corresponding to the scan ultrasonic beams and obtains a time correlation of the subject and determines at least one of the number of times of transmissions of ultrasonic transmission beams to be transmitted to the scan lines and a transmission timing based on the time correlation.

19. The ultrasonographic device according to Claim 12, wherein the transmitting means has modulation waveform phase rotating means that rotates the phase of the modulation wave

and rotates the phase of the modulation waveform in accordance with each modulation encoding coefficient of each of the modulation codes.

20. The ultrasonographic device according to Claim 12, wherein the receiving means has demodulation encoding coefficient phase rotating means that rotates the phase of each demodulation encoding coefficient of each of the demodulation codes and performs demodulation based on the phase-rotated demodulation encoding coefficient.